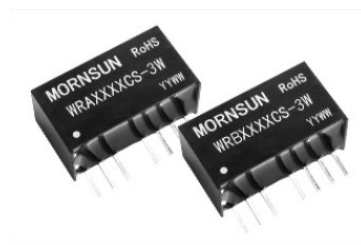


WRA_CS-3W & WRB_CS-3W Series 3W, WIDE INPUT, ISOLATED & REGULATED DUAL/SINGLE OUTPUT DC-DC CONVERTER



Patent Protection RoHS

FEATURES

- 2:1 wide input voltage range
- I/O Isolation 1500VDC
- Short circuit protection (automatic recovery)
- External On/Off control
- Internal SMD construction
- Operating temperature: -40°C to +85°C
- RoHS Compliance

APPLICATIONS

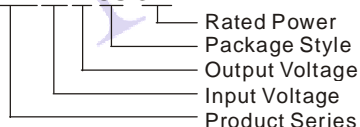
The WRA_CS-3W & WRB-CS-3W series are specially designed for applications where a wide range input voltage power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

These products apply to:

- 1) Where the voltage of the input power supply is wide range (voltage ranges 2:1);
- 2) Where isolation is necessary between input and output (Isolation Voltage ≤ 1500VDC);
- 3) Where the regulation of the output voltage and the output ripple noise are demanded.

MODEL SELECTION

WRA2412CS-3W



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PRODUCT PROGRAM

Part Number	Input			Output			Efficiency (%, Typ.)
	Voltage (VDC)			Voltage (VDC)	Current (mA)		
	Nominal	Range	Max.*		Max.	Min.	
WRA1205CS-3W	12	9.0-18	22	±5	±300	±30	74
WRA1209CS-3W				±9	±167	±16	76
WRA1212CS-3W				±12	±125	±13	78
WRA1215CS-3W				±15	±100	±10	79
WRB1203CS-3W				3.3	909	91	71
WRB1205CS-3W				5	600	60	74
WRB1209CS-3W				9	333	33	76
WRB1212CS-3W				12	250	25	74
WRB1215CS-3W				15	200	20	75
WRB1224CS-3W				24	125	13	78
WRA2405CS-3W	24	18-36	40	±5	±300	±30	76
WRA2409CS-3W				±9	±167	±17	78
WRA2412CS-3W				±12	±125	±13	79
WRA2415CS-3W				±15	±100	±10	80
WRB2403CS-3W				3.3	909	91	71
WRB2405CS-3W				5	600	60	76
WRB2409CS-3W				9	333	33	78
WRB2412CS-3W				12	250	25	80
WRB2415CS-3W				15	200	20	80
WRB2424CS-3W				24	125	13	82
WRB4805CS-3W	48	36-72	80	5	600	60	75
WRB4812CS-3W				12	250	25	78
WRB4815CS-3W				15	200	20	80

*Input voltage can't exceed this value, or will cause the permanent damage.

COMMON SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Units
Storage humidity				95	%
Operating temperature		-40		85	°C
Storage temperature		-55		125	
Temp. Rise at full load			15		
Lead Temperature	1.5mm from case for 10 seconds			300	
*No-load power consumption			300		mW
Cooling		Free air convection			
Case material		Plastic (UL94-V0)			
Short circuit protection		Continuous, automatic recovery			
MTBF		1000			K hours
Weight			6		g

Note: * 48V input products can be 500mW.

ISOLATION SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Units
Isolation voltage	Tested for 1 minute and 1mA max	1500			VDC
Isolation resistance	Test at 500VDC	1000			MΩ
Isolation capacitance	Input/Output, 100KHz/1V		80		pF

OUTPUT SPECIFICATIONS

Item	Test conditions	Min.	Typ.	Max.	Units
Output power	See above products program	0.3		3	W
Positive voltage accuracy	Refer to recommended circuit		±1	±3	%
Negative voltage accuracy	Refer to recommended circuit		±3	±5	
Load regulation	10% to 100% load (WRB_CS-3W) 10% to 100% load (WRA_CS-3W)*		±0.5 ±0.5	±0.75 ±1.0	
Line regulation	Input voltage from low to high		±0.2	±0.5	% / °C
Temperature drift (Vout)	Refer to recommended circuit			±0.03	
Ripple & Noise**	20MHz Bandwidth		50	100	mVp-p
Switching Frequency	100% load, input voltage range		300		KHz

*Dual output models unbalanced load (25/100%): ±5%Max.

**Test ripple and noise by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.

APPLICATION NOTE

1) CTRL Terminal

When open or high impedance, the converter work well; When this pin is 'high'; the converter shutdown; It should be note that the input current (Ic) should between 5-10mA, exceeding the maximum 20mA will cause permanence damage to the converter. The value of R can be derived as follows:

$$R = \frac{V_C - V_D - 1.0}{I_C}$$

2) Recommended circuit

If you want to further decrease the input/output ripple, an "LC" filtering network may be connected to the input and output ends of the DC/DC converter, see (Figure 1).

However, the capacitance of the output filter capacitor must be proper. If the capacitance is too big, a startup problem might arise. For every channel of output, provided the safe and reliable operation is ensured, the greatest capacitance of its filter capacitor sees (Table 1).

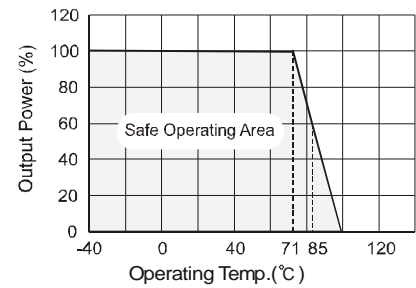
General: Cin: 12V 100μF
24V&48V 10μF-47μF
Cout: 100uF(Typ.)
Lin: 4.7μH -120μH
Lout: 2.2μH-10μH
Cs: 10μF-47μF

3) Input current

While using unstable power source, please ensure the output voltage and ripple voltage do not exceed indexes of the converter. The preceding power source must be able to provide for converter sufficient starting current Ip (Figure 2). General: Ip ≤ 1.4*Iin-max

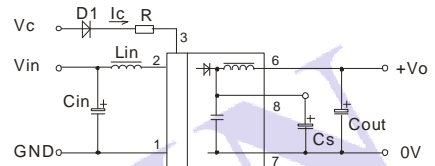
4) No parallel connection or plug and play

TYPICAL TEMPERATURE CURVE

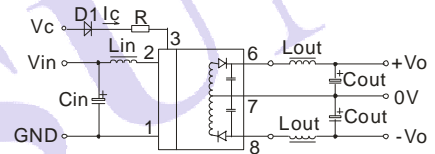


RECOMMENDED CIRCUIT

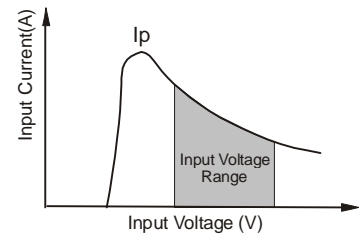
Single Output



Dual Output



(Figure 1)



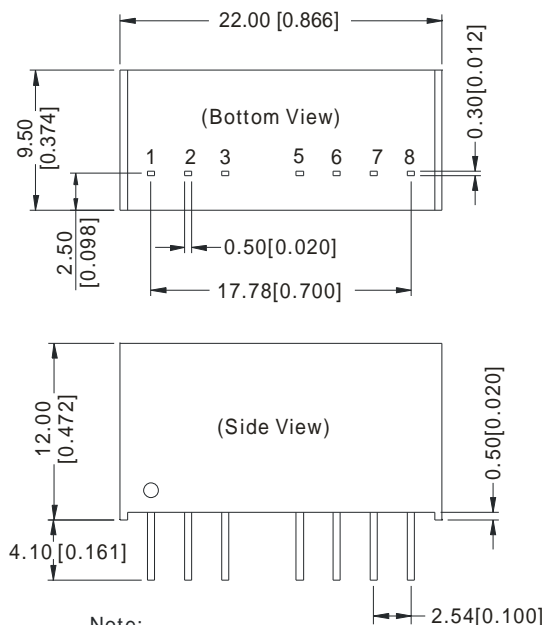
(Figure 2)

External Capacitor Table (Table 1)

Single Vout (VDC)	Cout (μF) (Max)	Dual Vout (VDC)	Cout (μF) (Max)
3.3	2200	±5	680
5	1000	±9	470
9	680	±12	330
12	470	±15	220
15	330	-	-
24	220	--	--

OUTLINE DIMENSIONS FOOTPRINT DETAILS

MECHANICAL DIMENSIONS

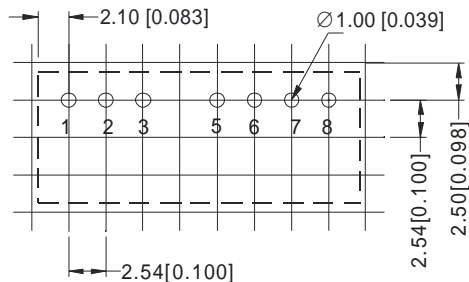


Note:
Unit:mm[inch]
Pin section tolerances: $\pm 0.10\text{mm}$ [$\pm 0.004\text{inch}$]
General tolerances: $\pm 0.25\text{mm}$ [$\pm 0.010\text{inch}$]

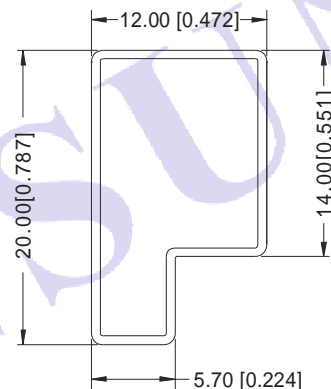
FOOTPRINT DETAILS		
Pin	Single	Dual
1	GND	GND
2	Vin	Vin
3	CTRL	CTRL
5	NC	NC
6	+Vo	+Vo
7	0V	0V
8	CS	-Vo

NC: No connection

RECOMMENDED FOOTPRINT(TOP VIEW)



TUBE OUTLINE DIMENSIONS



Note:
Unit :mm[inch]
General tolerances: $\pm 0.50\text{mm}$ [$\pm 0.020\text{inch}$]
L=530mm[20.866inch] Devices per tube quantity: 22pcs
L=220mm[8.661inch] Devices per tube quantity: 8pcs
Short tube inner packaging dimensions: L*W*H=255*170*80mm
Short tube outer packaging dimensions: L*W*H=375*280*270mm
Long tube inner packaging dimensions: L*W*H=580*200*100mm
Long tube outer packaging dimensions(with two inner packaging boxes):
L*W*H=600*215*220mm
Long tube outer packaging dimensions(with two inner packaging boxes):
L*W*H=600*215*325mm

Note:

1. The load shouldn't be less than 10%, otherwise ripple may increase dramatically or may not work properly.
2. Operation under 10% load will not damage the converter; However, they may not meet all specification listed.
3. All specifications measured at Ta=25°C, humidity<75%, refer to recommended circuit, nominal input voltage and rated output load unless otherwise specified.
4. To ensure reliable operation, the product output must be external 100μF aluminum electrolytic capacitance or greater than 10μF tantalum capacitance.
5. In this datasheet, all the test methods of indications are based on corporate standards.
6. Only typical models listed, other models may be different, please contact our technical person for more details.